SOME EXTERNAL PARASITES OF POULTRY

OHIO
Agricultural Experiment Station

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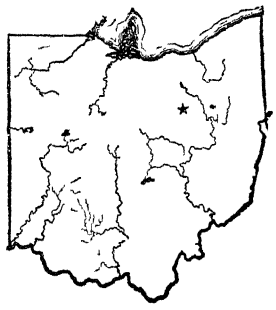
BULLETIN 320



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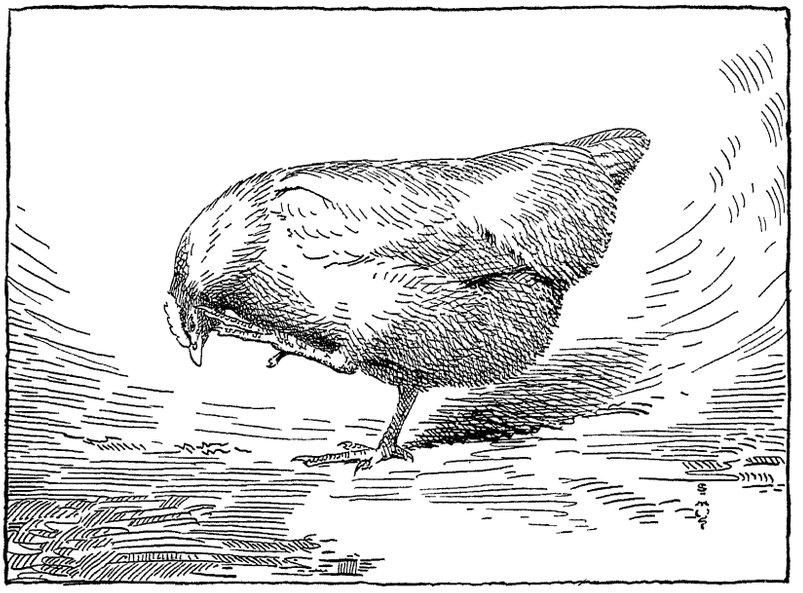
CONTENTS



BULLETIN
OF THE
Ohio Agricultural Experiment Station
NUMBER 320 DECEMBER, 1917

SOME EXTERNAL PARASITES OF POULTRY

D C MOTE[1]

This publication is designed to convey information to the poultry raisers of Ohio regarding some of the external parasites of poultry. Most of the parasites included in this bulletin have been found attacking fowls within the State. Some parasites, however, are mentioned that have not yet been collected in Ohio. Doubtless some of these may now be present in certain localities, while others may in the future be brought into the State on imported fowls.[2]

THE SMALL BODY LOUSE

Menopon trigonocephalum Olfers (*M. pallidum*)

Description.—The small body louse is perhaps the most abundant and most widely distributed of the poultry parasites. It is a small (less than one-sixteenth of an inch long), wingless, chewing insect provided with three pairs of short, stout legs. Each leg is provided with two sharp claws. The insect is well adapted for moving rapidly among the feathers.

Food and habits.—The food of this louse consists of bits of feathers, scales of the skin, and dried blood that may have issued from a wound or bruise. It does not puncture the skin and suck the blood of its host as do the mites. It may, however, by constantly biting at the skin, cause severe irritation.

Life history.—The eggs are deposited in clusters on the feathers around the vent. In 2 or 3 weeks tiny pale lice hatch from the eggs. They immediately begin feeding and, after shedding their skins several times, attain maturity. It is probable that adult lice live for a year or more. Theobald[3] has kept specimens of this species alive for 9 months.

[1]Illustrations in this bulletin unless otherwise noted, were drawn by R J Sim Appreciation is herewith acknowledged for both the drawings and his collections of external parasites of fowls and other birds

[2]If poultrymen are uncertain about the parasites they observe the specimens may be sent to the Ohio Agricultural Experiment Station for identification The specimens should be preserved in 70 percent alcohol They should be accompanied by brief notes upon their abundance and location on the host

[3]*The Parasitic Diseases of Poultry* (1896), p 31

Control.—As lice are permanent parasites, it becomes necessary to treat the infested birds with a substance that will check or destroy the lice. A dust insecticide is generally recommended for this purpose. The Cornell (Lawry) powder has given good results at the Ohio Station. It is made as follows:

Gasoline .....3 parts
Crude carbolic acid (90 to 95 percent tar acid). .. .. 1 part
Plaster of Paris—as much as the preceding liquids will moisten

One-fourth of a pint of crude carbolic acid and three-fourths of a pint of gasoline will moisten 2½ pounds of plaster of Paris. Mix thoroughly and then allow to dry for a few hours. When stored in an air-tight container, the powder will retain its strength for a long time. The powder should never be mixed nor placed near a flame.

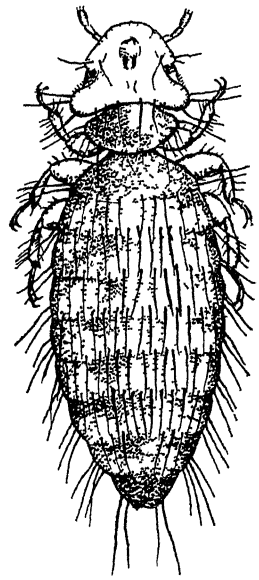


Fig. 1.—Small body louse (*M. trigonocephalum*) (x 36)

Each person after a little experience will adopt his own method for applying this powder. The Ohio Station applies it in the following manner: The powder is placed in a box (24 in. by 15 in. by 12 in.) and carried into the pens where the birds are to be treated. The chickens are hurdled into close quarters to facilitate catching. Two men do the work, the one catching the birds and the other dusting them. Each fowl is held by the wings with one hand and then thoroughly dusted, especially about the vent, in the fluff, and under the wings, with the other hand. The hands should be protected by gloves as the dust is somewhat injurious to the skin. Proceeding in this manner two men were able to dust 250 chickens in 2 hours. Immediately after dusting, some of the birds close their eyes, become dizzy and inactive. In a few moments, however, they become normal. No peceptible injury to the fowl results from the dusting. Before the first treatment in the tests made by the Ohio Station, the

birds were extremely lousy; dozens of lice were observed moving rapidly over the skin and among the feathers when the feathers were opened to expose the body. On examining 100 birds (just before the second dusting) only 15 were infested, and the lice on these birds were difficult to find.

Cost of treatment—The cost will vary with the amount of dust used per bird, the cost of materials, size of birds, and method of application. When the powder was used freely, it took about 10 pounds of the mixture to dust 100 mature birds. The Cornell University poultrymen in their experiments were able to dust about 80 birds (age not stated) with 1 pound of the mixture.[1]

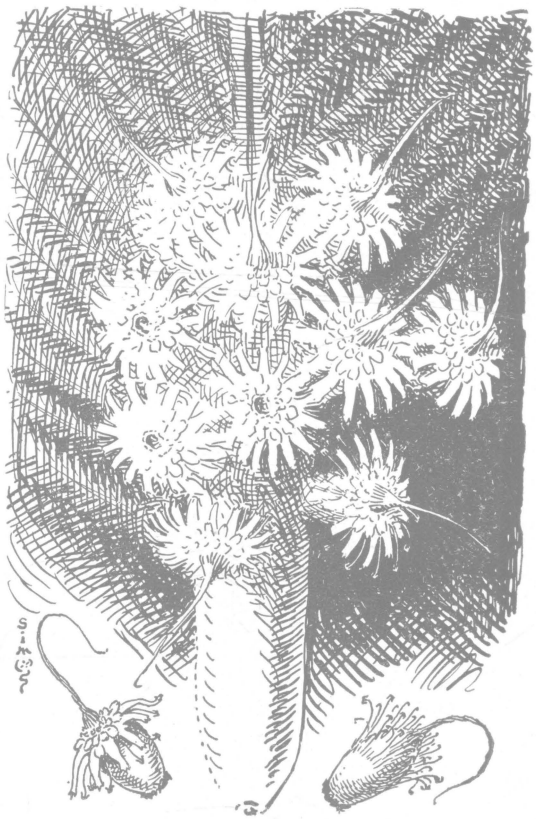


Fig. 2.—Eggs of body lice (x 22)

THE LARGE BODY LOUSE

Menopon biseriatum Piaget

Description.—The large body louse is reported by some investigators to be as abundant as the small body louse. The two species resemble each other both in habits and in form; hence, it is quite likely that they are often confused. However, as indicated by its common name, this insect is much larger than the small body louse.

[1]Farmers' Bulletin 801, issued by the U. S. Department of Agriculture, Washington, D. C., recommends the use of sodium fluorid for the eradication of chicken lice. When used in powder form, it is sprinkled among the feathers, on the head, neck, underparts of the body, beneath the wings and around the vent. One pound will treat 100 fowls. It may also be used as a dip: 1 ounce of the commercial powder is added to each gallon of water. It is recommended that only warm sunny days be chosen for this operation. When used in solution from 5 to 6 ounces of sodium fluorid will treat 100 fowls.

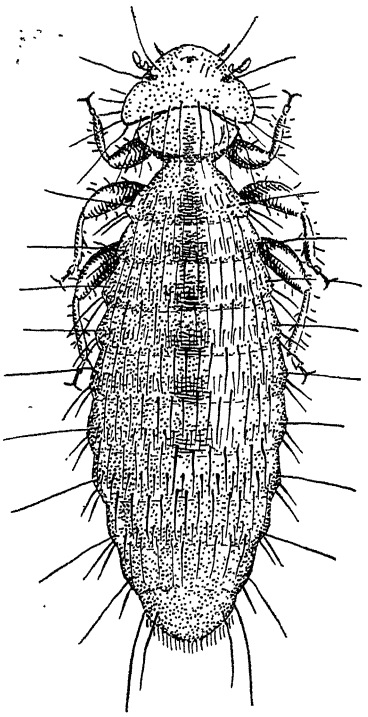


Fig. 3.—Large body louse (*M. biseriatum*) (x 26)

chickens. As indicated by its popular name, this louse is generally found in the region of the head. It is darker in color than the common body louse and is easily observed, especially upon white birds.

Habits.—This species differs greatly in habits from the two previously described. It is found upon the feathers rather than upon the skin, generally at the point where the barbs begin. Compared with the lively body lice, these insects are sluggish, moving rather slowly among the feathers. Their eggs may be found attached to the barbs of the shorter feathers surrounding the eyes and on top of the head. Adults vary from one-tenth to one-eighth of an inch in length, are yellowish in color, often with dark centers due to food in the alimentary canal. This species is also much more hairy than the smaller body louse.

Control.—As the habits, life history and food are similar to those of the small body louse, similar measures should be taken to combat this parasite.

THE HEAD LOUSE

Lipeurus heterographus Nitzsch

Description.—The head louse, although not found as frequently as the body louse, was nevertheless quite abundant on many fowls of Wayne County, especially on young

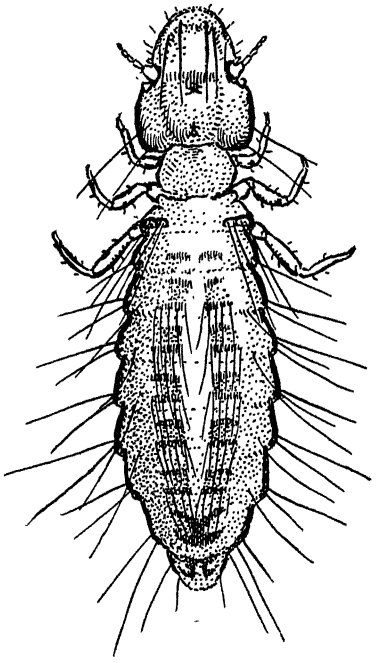


Fig. 4.—Head louse (*L. heterographus* (x 40)

Food.—This louse also has biting and chewing mouth parts, which are not adapted for piercing the skin or digging into the flesh. Because this species is found on the feathers with its head close to the skin, some erroneously imagine that it digs into the flesh and may even eat out the chicken's brains.

Remedy.—Many of the remedies recommended for combating other chicken lice were found to be useless for exterminating the head louse. Vaseline seemed to have some effect, but a thorough examination of the birds to which it was applied showed that the lice had moved to less unctuous parts. Crude oil, which appears to be effective for hog lice, had little or no effect upon the chicken head louse, nor did the Cornell (Lawry) powder, so effective in combating body lice, prove as useful in exterminating the head louse.

Fig. 5.—Eggs of head louse attached to barbs of a feather (x 45)

The best remedy, the one that exterminated the lice on all the birds in the experimental trials, was mercurial ointment, blue ointment or "blue butter." While these terms are often used synonymously, they stand for products differing both in price and in composition. Mercurial ointment contains 50 percent of metallic mercury, which is the substance that kills the lice. At present prices mercurial ointment is cheaper on the basis of metallic mercury obtained. Since blue ointment is stiff and difficult to apply, it is recommended that the poultryman buy mercurial ointment and have his druggist mix it with vaseline, lanolin or other similar material. The Storrs (Connecticut) Station reports that one part of mercurial ointment to two parts of vaseline still contains sufficient

metallic mercury to be effective against the lice. If the poultryman mixes the ingredients, he should place them upon a clean piece of glass and work them together thoroughly with a knife.

To apply this ointment take a lump about the size of a pea; and with the tip of the finger, rub well at the base of the feathers about the head. Mercurial ointment should not be used too freely. Large quantities when applied over large surfaces may lead to poisoning.

THE LESS COMMON LICE

Several other species of lice have been reported to occur upon chickens, but not in sufficient numbers to do much damage. None of these has been taken in this State, but this does not signify that they do not occur on Ohio chickens.

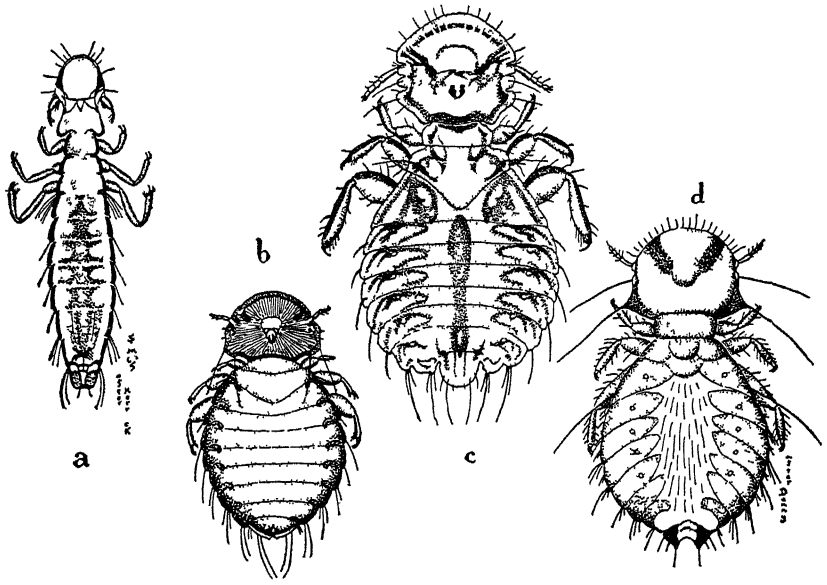


Fig. 6.—(a) Variable hen louse (*L. caponis* [*variabilis*]) (x 22); (b) Lesser chicken louse (*G. gallinae*) (x 25); (c) Large chicken louse (*G. gigas*) (x 15); (d) Chicken goniodes (*G. dissimilis*) (x 16)

The variable hen louse (*Lipeurus caponis* [*variabilis*] Linne) in a general way resembles the head louse. It is distinguished from the head louse, however, by its rounded head and narrower body. Deny[1] says that these lice "prefer the primary and secondary feathers of the wings, among the webs of which they move with great celerity."

[1]Monographia Anoplurorum Britanniae, London

The large chicken louse (*Goniocotes gigas* [*abdominalis*] Taschenberg) is a large, conspicuous species one-eighth to one-sixth of an inch in length. Its head is broad, rounded in front. The abdomen is oval and quite broad, presenting at the border of each segment conspicuous black bands extending toward the middle of the body.

The lesser chicken louse (*Goniocotes gallinae* [*hologaster*] Retzius) is a very small, inconspicuous species scarcely measuring one twenty-fifth of an inch in length.

The chicken goniodes (*Goniodes dissimilis* Nitzsch) is one of the larger species, measuring about one-tenth of an inch long. It is apparently not common, for it has never been recorded for the United States. Theobald,[2] however, says that in England it is an "abundant species on most varieties of fowls and is especially located under the wings and on the rump."

THE RED MITE, POULTRY MITE OR ROOST MITE
Dermanyssus gallinae de Geer, 1778

AND THE BIRD MITE
Dermanyssus hirundinis Hermann, 1804

Description and habits.—The poultry mite and bird mite are small, pear-shaped, blood-sucking mites and are perhaps the most persistent and injurious pests of fowls. Their habits differ markedly from those of the louse. They are seldom found by the poultry keeper upon his fowls because of their nocturnal habits. The mites normally feed upon the birds at night leaving them during the day to hide in the cracks and crevices of the perches or walls of the henhouse and in the nest boxes. They have a habit of congregating in groups, and it is not uncommon to find swarms of them under the roosts or in the nest boxes. When they are so numerous, it is a disagreeable task to gather the eggs and care for the chickens, as the mites crawl upon the body, producing an annoying irritation.

The bird mite is larger than the hen mite and is of a violet brown color. The bird mite measures from 1 to 1.4 millimeters (0.039 to 0.05 inch) long by 0.6 to 0.9 millimeter (0.023 to 0.035 inch) wide, while the poultry mite measures only 0.6 to 0.7 millimeter (0.023 to 0.027 inch) long by 0.3 to 0.4 millimeter (0.012 to 0.017 inch) wide. Possibly the bird mite is as common in poultry houses as the poultry mite. The former species has been collected at two different localities in Wayne County, while there are no specimens of the poultry mite represented in the parasite collection of the Ohio Station.

[2] *Parasitic Diseases of Poultry* (1896), p. 4

Life history.—These mites breed so rapidly that if infested poultry plants are not treated in the spring, they will be almost uninhabitable by midsummer. The adult female lays her small, shiny white, oval eggs in the hiding places among the cast skins, dust and other debris. In from 2 to 6 days according to various observers, there hatch from the eggs tiny, active, six-legged larvae. These feed for a short time and cast their skins, emerging this time with eight legs. They shed their skins several times before reaching maturity. Mites are capable of living a long time without feed. Even the young have survived several months without access to any food.

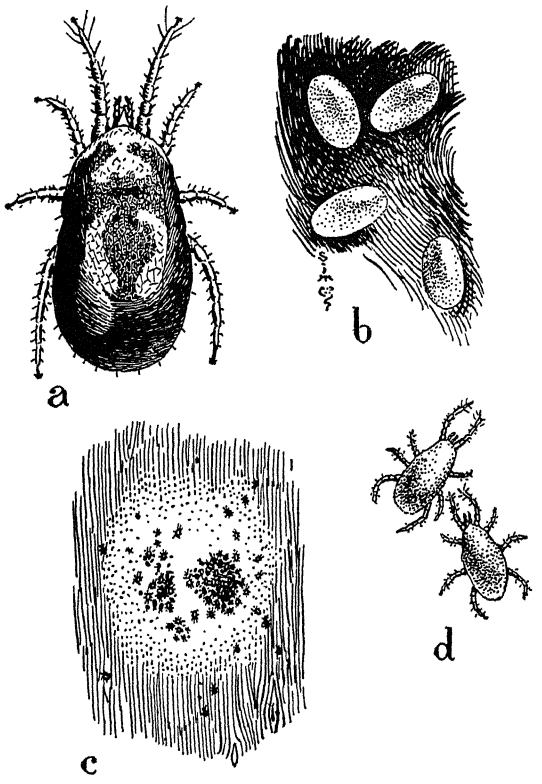


Fig. 7.—(a) Bird mite (*D. hirundinis*); (b) Eggs; (c) A swarm of mites about natural size; (d) Young mites (x 30)

Remedy.—Frequent cleaning and liberal use of a good insecticide will aid materially in preventing an outbreak of mites. For painting or spraying the perches, dropping boards, walls, floors and nests, the following solutions are good:

Kerosene and carbolic acid.—Three parts of kerosene mixed with one part of either 90 to 95 percent crude carbolic acid, or commercial cresol has proved effective.

Cresol disinfecting solution.—Measure out in a 5-gallon stone crock 3⅕ quarts of raw linseed oil. In another container dissolve, in as little water as is required, 1 pound 6 ounces of commercial lye. Start with one-half pint of water and add more very slowly, if more is needed to dissolve the lye. Let this solution stand for 3 hours to dissolve the lye thoroughly and cool. Then *very slowly* add the

lye solution to the raw linseed oil, taking not less than 5 minutes to add it. The oil should be stirred while the lye is being added and until a smooth liquid soap is produced, which generally takes about half an hour. Now *very slowly* stir into the liquid soap mixture 8½ quarts of commercial cresol. This gives a clear dark-brown fluid which will mix with water in any proportion. For most work a 5-percent solution with water is used, or about 12 tablespoonfuls to a gallon of water when mixed in small quantities.

Kerosene emulsion.—Dissolve one-half pound of hard soap in 1 gallon of water by gently boiling; then add 2 gallons of kerosene and stir vigorously. To use dilute with water to 20 gallons, or mix one part of the emulsion with six parts of water. Keep away from the fire when using the kerosene, as it is inflammable.

Lime-sulphur solution of the strength used for dormant spraying is said to be effective in combating poultry mites.

In using these solutions care should be taken not to get any on the eggs as they give the eggs an undesirable flavor.

Application.—In order to make the insecticides more effective, remove the nests and perches. Then clean the walls thoroughly; sweep up all the loose material from the floor and burn it together with the old nest material. The inside of the house should then be sprayed with one of the solutions recommended. The liquid should be forced into every crevice, and every square inch of the walls, floors, dropping boards and other immovable objects should be thoroughly wetted. The use of a spray pump by means of which the liquid can be forced into the cracks is the most effective method of application. It is advisable to make a second application in a week to 10 days to kill those mites that may have been missed or that have hatched out since the first treatment. The perches should be treated with the same material before they are replaced.

HARVEST MITES

Trombidium sp.

Description.—The young, or six-legged larval form, of the mites commonly known as chiggers, jiggers or red bugs, sometimes seriously annoy young chicks. They may even be primarily responsible for a high mortality.

Prof. G. W. Herrick,[1] of Cornell University, describes an attack of red bugs on young chickens in Mississippi: "The young chickens in the poultry yards of the Agricultural College were attacked during two successive summers by these pests. On May 28, 1908, two

[1] *Some External Parasites of Poultry*, Cornell Univ. Agr. Exp. Sta. Bul. 359 (1915), p. 259.

young chicks that were evidently diseased were examined and on the sides of the body, where the feathers were scarce were found here and there rather large red nodules or tubercles. The nodules were usually capped around the edges of the top at least with a hard scab or crust. In the center of the crust of each nodule were found the red, distended abdomens of numerous mites with their heads buried in the tissues. When the scab was removed the mites came along with it leaving a comparatively large cavity in the center of the nodule."

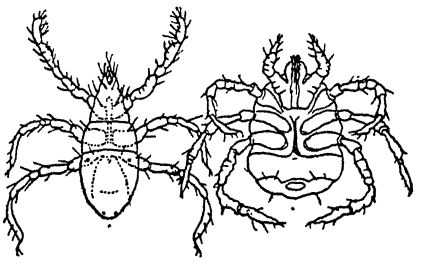


Fig. 8.—Chiggers: *Leptus americanus* at left; *Leptus irritans* at right. Dots under anal extremity indicate natural size (after Riley)

While no birds have been reported to the Ohio Station as being attacked by harvest mites, such attacks are possible since these parasites commonly attack man and some of the domestic animals in various localities of the State.[1]

Life history.—The adult female lays her eggs during the spring and early summer. The eggs hatch into orange-red, sphere-shaped larvae with six legs. These larvae crawl up tall weeds, grass, bushes and shrubbery located nearby, usually in shady, moist places. From these points of vantage they attack the first unfortunate being that passes by, be it man or beast, or even an insect, which is their normal host. When full fed the larvae if able to extricate themselves drop to the ground and molt, this time emerging with eight legs. It is said this form attacks insects only and, after feeding and molting, eventually changes into an adult. The mature mite is not parasitic but wanders about feeding on small insects, as plant lice and young caterpillars; and one species (*T. locustarum* Riley) is known to destroy a great many grasshopper eggs.[2]

Remedy.—In infested localities it is advisable to confine the young chicks to runs kept free from weeds and tall grass. Abundant sunshine seems to be detrimental to this pest. To prevent fowls from becoming infested, flowers of sulphur dusted among the feathers is recommended. Infested fowls may be treated with a feather dipped in petroleum or benzine and touched to the nodules on the skin in which the young mites are fixed. Care should be exercised not to spread the kerosene or benzine, as it may blister the skin.

[1]See Ohio Agr. Exp. Sta. Mo. Bul. 1 (1916), No. 7, p. 221.
[2]Banks, Nathan, *The Acarina or Mites*, Rpt. 108, Bur. Ent., U. S. Dept. Agr.

THE SCALY LEG MITE

Cnemidocoptes mutans Robin and Lanquetin, 1859

Description.—Scaly leg, sometimes called "bumble foot," is a long-known affection of chickens. Its parasitic nature was first demonstrated in 1859 by Ch. Robin and Lanquetin. These investigators discovered that scaly leg is due to the presence of an extremely minute oval-shaped mite, the male measuring about 0.0078 inch long, while the female attains a length of about twice that of the male.

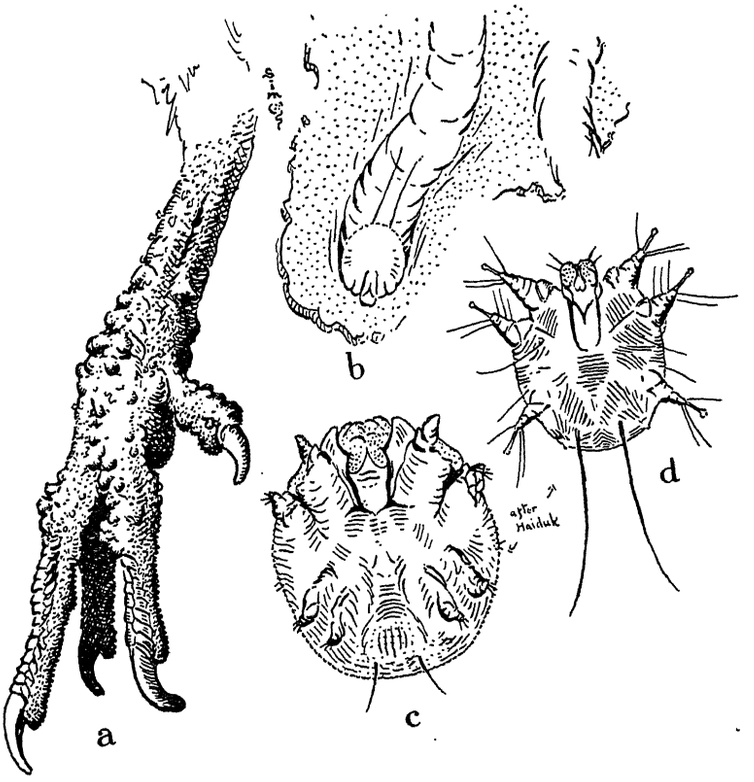


Fig. 9.—Scaly leg (*C. mutans*): (a) Leg of chicken infested by mites (reduced); (b) Mite in burrow in skin (x 60); (c) Adult female (x 82); (d) Adult male (x 130)

Occurrence in Ohio.—This affection has been observed in many flocks in the State and several reports of its occurrence have been received by the Station. A report accompanied by specimens of affected legs was received in February, 1917, from Madison County. The correspondent said that the affected hen though apparently

healthy could not walk and sat around in the litter, up to the time he killed her. She laid eggs in the litter on the floor because she could not get into the nest. He has had a number of hens affected with scaly leg but no others were so thoroughly crippled.

Symptoms.—The affection generally begins on the legs and seldom spreads to other parts. Elevated epidermic scales are formed at the point of invasion. From these scales a fine whitish powder escapes, becoming mixed with the exuding serum caused by the irritation of the mites. Little by little the crusts become larger and more abundant as the mites multiply and spread to healthy tissue. Under the crusts the skin is irritated and bloody. Badly affected birds walk with difficulty, at times painfully. They may even lose a part or all of a toe. The disease develops slowly and may endure from 6 months to a year. Affected birds may then become thin, lose their appetites and in time become worthless. The mites are found in the crusts and on the innerside of the crusts. Fifty mites were counted on the innerside of one piece of scab about a quarter of an inch square removed from the specimen previously mentioned. An estimation of the total number of mites on a leg based on this count would exceed 3,000.

Contagion.—Fortunately this disease does not appear to be highly contagious. It is not rare to observe birds affected with scaly leg of long standing, living with birds which remain free from attack; but though the contagion is slow, the mites do spread from diseased to healthy birds by contact with the diseased birds or with the perches and nests which they use. Scaly leg may readily be introduced into a healthy flock by the purchase of infested birds.

Remedy.—In order to prevent this and other parasites from being introduced into his flock, it is advisable for the poultry keeper to provide a quarantine pen. Every bird brought to the farm from outside sources should be examined, treated for lice and mites if infested, and placed in the quarantine for a certain time to see whether any contagious or infectious disease develops. The treatment of birds already attacked by mites consists in loosening and removing the crusts and killing the mites so that no more crusts may be formed. The crusts are softened by soaking the feet and legs in warm water for several minutes. The scales can then be removed, but care must be taken not to cause too much irritation and bleeding. After the diseased surface is dry, an acaricide or mite killer is applied. Many have been recommended, but the following seem to give the best results:

(1) Oil of caraway, one part, and lard or vaseline, four parts

(2) Sulphur ointment (See p. 152.)

Some poultrymen have used a mixture of one part of kerosene and two parts of raw linseed oil with speedy effect. Both legs of the affected bird are dipped in the mixture at the same time, and then allowed to drain and later the bird is replaced on the roost. Care is advised in the use of coal oil not to wet the feathers, as this may cause irritation and blister the skin. It should be remembered that old or badly infested cases may be slow to show improvement. Though all the mites may be killed, the leg has become so abnormal that it may never again attain a normal condition. For this reason it is advisable to treat fowls as soon as the infestation is observed.

THE DEPLUMING MITE

Cnemidocoptes laevis var. *gallinae* Raillet, 1886

Description and habits.—The depluming mite of chickens is slightly smaller than the scaly leg mite, from which it differs also in its manner and location of attack. It is most often spread by male birds, which seem to be more severely affected. The mites generally manifest themselves first on the rump whence they spread to the back, abdomen and legs. The head and upper part of the neck may early show the attacks of this mite. In the infested regions the feathers begin to fall and the skin becomes bared over a more or less extended area. The large feathers of the wings and tail generally remain intact. At the base of the feathers in the region of the infested area may be found an abundance of dry scales and many mites. While some affected birds become thin and fall off in egg production, more often they are only slightly annoyed by the parasite. Neumann[1] states that most cases of feather picking considered generally as a vicious habit should be ascribed to the ravages of this mite.

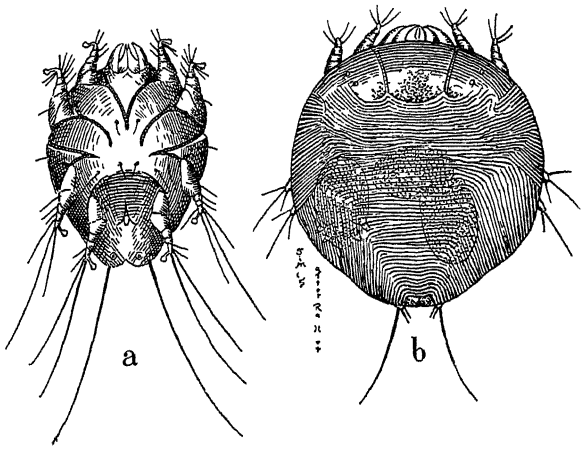


Fig. 10.—Depluming scabies (*C. laevis* var. *gallinae*); (a) Adult male (x 114); (b) Adult female (x 108)

[1]Neveu-Lamaire, *Parasitologie Des Animaux Domestiques* (1911), p. 919.

Remedy.—Care should be exercised not to introduce this parasite into healthy flocks through imported birds. The infested birds should be isolated and treated with one of the following parasiticides: oil of caraway ointment (see page 150), balsam of Peru, creolin (1 to 10) or Salmon's ointment, which consists of:

Flowers of sulphur	1 dram
Carbonate of potash	20 grains
Lard or vaseline	½ ounce

Crude oil or a reliable coal-tar preparation may also be effective. It is advisable to buy the sulphur ointment from a druggist as he is thoroughly familiar with mixing such compounds. Mixtures containing sulphur should be made and used with care.

THE STICK-TIGHT, OR SOUTHERN CHICKEN FLEA

Echidnophaga [*Sarcopsylla*] *gallinacea* Westwood, 1875

Occurrence.—The stick-tight flea is a common parasite of chickens in the southern and southwestern states. It has never been reported in Ohio, but it is reported as injurious to poultry as far north as Kansas. For this reason it is included in this discussion of poultry parasites so that poultrymen may be on the lookout for it and have means of combating the pest as soon as it is observed.

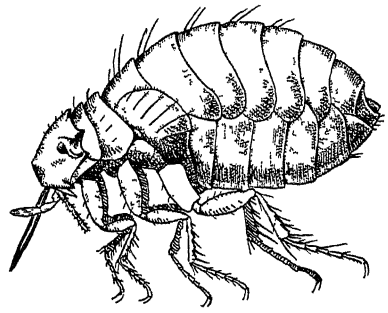


Fig. 11.—Stick-tight flea (*E. gallinacea* (x 32)

Description and habits.—This tiny, flat-sided, hard-bodied creature differs in its habits from most fleas. It attacks many animals including poultry, dogs, cats and horses. Moreover, the adult flea remains for a greater part of its life attached to the host animal. The Ohio Station has a preserved specimen of the head of a chicken infested with this flea. This specimen was presented to the Station by Dr. Mark Francis, of Texas, in November, 1896. Although it is more than 20 years old the head is still studded with numerous tiny, pale, brown specks, as the fleas appear on the white skin background. On living birds they appear as dark areas, and when attached in large clusters, as is their habit, about the eyes, comb and wattles, may be recognized at a considerable distance.[1] Young chicks quickly succumb to heavy infestations. Older birds are more resistant.

[1]Bishopp, F C, *Fleas as Pests to Man and Animals, with Suggestions for Their Control*, Farmers' Bulletin 683, U S. Dept. Agr.

Life history.—The eggs are laid by the engorged female either while she is attached to the host or after she has fallen to the ground. In either case the eggs mingle with the dirt and organic matter of the poultry house. From the eggs there hatch in a few days pearly white, wormlike larvae. The larvae feed generally upon the organic matter, reaching maturity in a week or so. They then pupate. Soon fleas emerge from the cocoons eager for a meal of blood after such a prolonged fast.

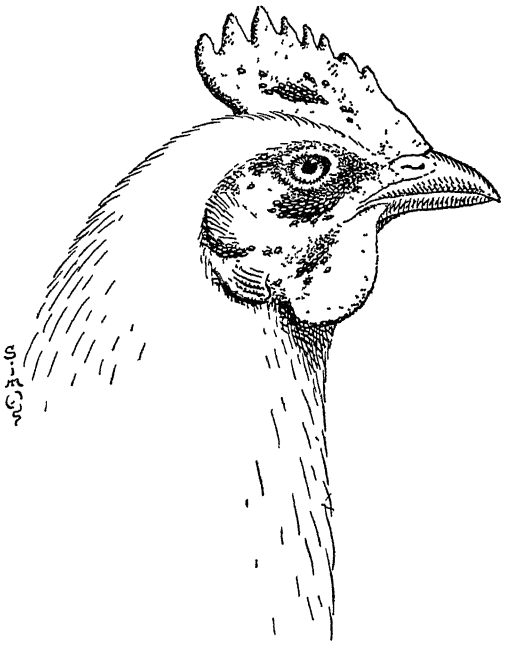


Fig. 12.—Head of chicken showing stick-tight fleas on comb and around the eye (reduced)

Remedy.—It is advisable to keep dogs, cats and wild animals away from the poultry houses, for these animals may harbor and spread fleas. A thorough cleaning of the poultry houses and other buildings occupied by the infested chickens is recommended. The loose material should be burned or spread some distance from the poultry yards upon a field which is soon to be plowed.

In those places where fleas are thought to be breeding Bishopp recommends the application of crude oil, or "one of the most satisfactory methods of preventing breeding is to scatter salt freely about the chicken house and then wet the soil thoroughly. This species cannot thrive under this treatment and if sprinkling with water is done two or three times a week no further breeding is possible." If salt is used, due care should be taken to prevent the fowls from eating it on account of its poisonous qualities when consumed in excessive amounts. The effect of damp floors upon the health of the chickens should also be considered in the use of this remedy. This treatment under Ohio conditions may be available only in the summer. Because of the resistance of the fleas, the treatment of infested birds is not always successful. Those

remedies recommended for the scaly leg or depluming mites may be of service. Bishopp recommends the careful application of carbolated vaseline or kerosene and lard (kerosene one part to two parts of lard) to the infested regions only. Dogs and cats should be freed by following the directions given in the Ohio Station Bulletin 253 or by washing them in a saponified coal-tar creosote preparation. Rats sometimes harbor these fleas; hence in order to overcome this parasite all rats about the premises should be exterminated.

THE EUROPEAN HEN FLEA

Ceratophyllus avium Taschenberg, 1880

Description and habits.—This parasite, like its relative, the stick-tight flea, is flattened from side to side and clothed with a hard spiny shell. It is provided with blood-sucking mouth parts and three pairs of legs, the last pair being unusually well developed for jumping purposes. Unlike the stick-tight flea, this species does not live permanently upon the chickens. It is found usually in nests and other hiding places in the poultry house.

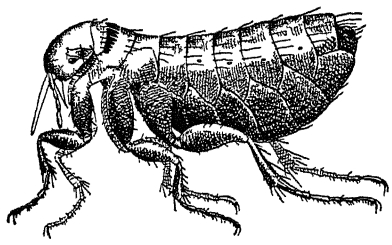


Fig. 13.—European hen flea (*C. avium*) (x 12)

Occurrence.—Only one instance of this species attacking poultry has been brought to the attention of the writer. Specimens were collected by R. J. Sim, April 4, 1913, at Geneva, Ashtabula County. The owner of the poultry reported that this pest had been rather bad and seemed to produce a noticeably injurious effect upon his hens. They may jump upon one attending the chickens, and their efforts to obtain blood are very painful. The specimens were collected by taking the straw out of a wooden pail used for a nest.

Life history.—The life history of this flea according to Theobald is as follows: The female lays the small white eggs in the nests of the birds or among the dirt and droppings. In a week or so, tiny, slender, whitish worms emerge from these eggs. They probably feed upon the dirt of the nests and when mature seek cracks or crevices where they spin pale silk cocoons. Within these the worms or larvae undergo changes resulting in adult fleas at the end of 10 to 21 days.

Remedy.—The same methods recommended for the red mite of poultry should be effective in combating this pest. Crude oil applied to the floors and sides of the henhouse and in the crevices is advised for killing the fleas and preventing their breeding.

BEDBUGS

Acanthia sp

Occurrence.—This much-detested pest is not content with attacking man in his habitation but also attacks the animals that are under his care. At least this would appear from reports of these bugs infesting chicken coops in various parts of the State.

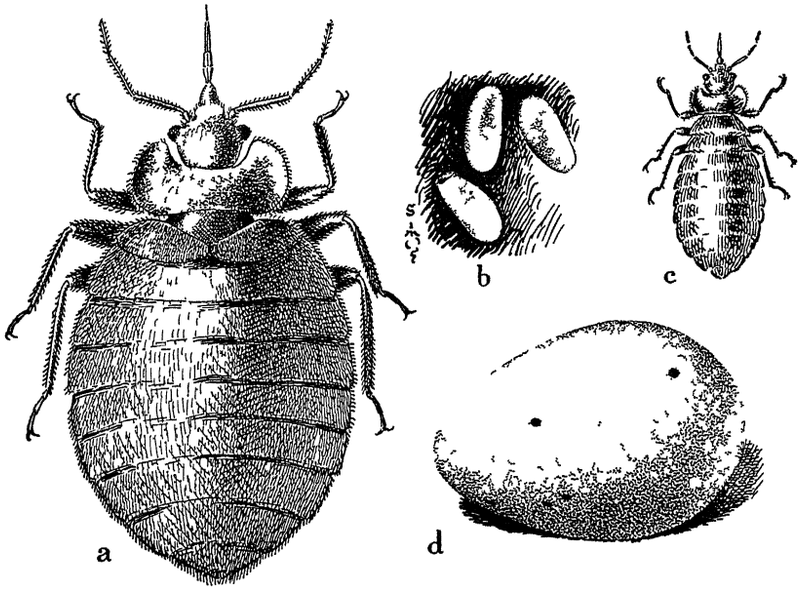


Fig. 14.—Bedbug (*Acanthia lectularia*): (a) Adult (x 13); (b) Eggs (x 12); (c) Young (x 10); (d) Hen egg showing black excrement of bedbug

Two reports accompanied by specimens have been received by the Station. Specimens were received in October, 1914, from the Southeastern Test Farm, Meigs County, accompanied by the following note: "We have a problem on hand with some insects that we call bedbugs. There are lots of them. Coal oil will kill them, but we cannot get at them all with the oil."

Specimens were received in October, 1916, from Ross County with the statement that "they have infested our hen house for several years."

Longevity.—Some of the specimens collected in 1916 were crushed in transit, leaving blood spots on the envelope containing them. Eighteen of the bugs were still alive when received. These were placed in a capsule containing cotton where they remained alive for 35 days without food or moisture. On several mornings the temperature of the laboratory was as low as 16 degrees C. (60.8 degrees F.) On these mornings the bugs would be dormant or inactive, but on being warmed they became quite active.

Species.—There are several species of bedbugs listed as attacking chickens: The "Curuco," or Mexican chicken bug (*Acanthia inodora*), of southern New Mexico and western Texas; the barn swallow bug (*Acanthia hirundinis*), a common pest of swallows; and the European pigeon bug (*Acanthia columbaria*). However, the species attacking chickens in Ohio was determined as the true bedbug (*Acanthia lectularia*). For the life history of the bedbug the reader is referred to Bulletin 253 of this Station.

Habits.—This insect pest, like other nocturnal parasites, stays during the day in the nests and crevices of the chicken house. If in sufficient numbers it may torment the chickens to the point of arresting their development and checking their egg production. The sitting hen is especially exposed to attack. The hen becomes restless, quits the nest, returns to it with hesitation and often finally abandons the eggs altogether. In general one may readily determine whether the hen deserted as a result of the attacks of bedbugs by looking on the surface of the eggs for small black spots formed by the excrement of these insects.

Remedy.—In combating this pest divers procedures have been recommended. The custom of burning sulphur in the chicken house is effective if done thoroughly in an air-tight house. The recommendations for mites should prove effective in combating this parasite. One correspondent states that "a mixture of one-third gasoline and two-thirds coal oil applied with a spray pump was a very satisfactory remedy. A few applications will rid the house of the pests."